

What is claimed is:

1. An information-recording method for recording information on an information-recording medium, the information-recording method comprising:

moving a light beam at a selected linear velocity relative to the information-recording medium;

controlling the light beam to generate a multi-pulse having at least three power levels of a first power level P_h , a second power level P_l which is lower than the first power level, and a third power level P_m which is intermediate therebetween, the multi-pulse being repeatedly modulated between the first power level P_h and the third power level P_m ;

adjusting the third power level P_m in response to the selected linear velocity; and

recording the information by irradiating the information-recording medium with the controlled light beam including the adjusted third power level to change a state of an irradiated portion of the information-recording medium.

2. The information-recording method according to claim 1, wherein the third power level P_m is adjusted so that the third power level P_m is increased in proportion to the linear velocity.

3. The information-recording method according to claim 1, wherein a ratio P_m/P_h of the third power level P_m with respect to the first power level P_h is adjusted in response to the linear velocity.

4. The information-recording method according to claim 3, wherein the ratio P_m/P_h of the third power level P_m with respect to the first power level P_h is adjusted so that the ratio P_m/P_h is increased in proportion to the linear velocity.

5. The information-recording method according to claim 1, wherein a ratio $(P_m - P_1)/(P_h - P_1)$ of a difference between the third power level P_m and the second power level P_1 with respect to a difference between the first power level P_h and the second power level P_1 is adjusted in response to the linear velocity.

6. The information-recording method according to claim 5, wherein the ratio $(P_m - P_1)/(P_h - P_1)$ is adjusted so that the ratio $(P_m - P_1)/(P_h - P_1)$ is increased in proportion to the linear velocity.

7. The information-recording method according to claim 1, wherein a pulse width of a leading pulse or a tail

pulse of the multi-pulse is adjusted in response to the third power level P_m .

8. The information-recording method according to claim 7, wherein the pulse width of the leading pulse or the tail pulse of the multi-pulse is adjusted so that the pulse width is increased in proportion to the third power level P_m .

9. The information-recording method according to claim 1, wherein a pulse width of a leading pulse or a tail pulse of the multi-pulse is adjusted in response to a ratio P_m/P_h of the third power level P_m with respect to the first power level P_h .

10. The information-recording method according to claim 9, wherein the pulse width of the leading pulse or the tail pulse of the multi-pulse is adjusted so that the pulse width is increased in proportion to the ratio P_m/P_h of the third power level P_m with respect to the first power level P_h .

11. The information-recording method according to claim 1, wherein a pulse width of a leading pulse or a tail pulse of the multi-pulse is adjusted in response to a ratio $(P_m - P_1)/(P_h - P_1)$ of a difference between the third power

level P_m and the second power level P_l with respect to a difference between the first power level P_h and the second power level P_l .

12. The information-recording method according to claim 11, wherein the pulse width of the leading pulse or the tail pulse of the multi-pulse is adjusted so that the pulse width is increased in proportion to the ratio $(P_m - P_l)/(P_h - P_l)$ of the difference between the third power level P_m and the second power level P_l with respect to the difference between the first power level P_h and the second power level P_l .

13. The information-recording method according to claim 1, further comprising reading the selected linear velocity from the information-recording medium before recording the information, wherein the information is recorded with the CLV system.

14. The information-recording method according to claim 1, wherein the information is recorded with the CAV system, and the selected linear velocity differs depending on a position on the information-recording medium in which the information is recorded.

15. An information-recording medium for recording

information by irradiating the information-recording medium with a light beam to change a state of an irradiated portion of the information-recording medium, the information-recording medium comprising:

- a recording layer which causes the change of state;
- a substrate which supports the recording layer; and
- management information which is recorded on the substrate or the recording layer, wherein:

- the radiating light beam is modulated to contain a multi-pulse having at least three power levels of a first power level P_h , a second power level P_l which is lower than the first power level, and a third power level P_m which is intermediate therebetween, the multi-pulse being repeatedly modulated between the first power level P_h and the adjusted third power level P_m ; and

- the management information includes information which relates to a linear velocity for moving the light beam relative to the information-recording medium and information which relates to the first power level P_h , the second power level P_l , and the third power level P_m adjusted in response to the linear velocity.

16. The information-recording medium according to claim 15, wherein the management information includes a ratio P_m/P_h between the first power level P_h and the third power level P_m .

17. The information-recording medium according to claim 16, wherein the ratio P_m/P_h is adjusted in response to the linear velocity.

18. The information-recording medium according to claim 15, wherein the management information includes information which represents a ratio $(P_m - P_1)/(P_h - P_1)$ of a difference between the third power level P_m and the second power level P_1 with respect to a difference between the first power level P_h and the second power level P_1 .

19. The information-recording medium according to claim 18, wherein the ratio $(P_m - P_1)/(P_h - P_1)$ is adjusted in response to the linear velocity.

20. The information-recording medium according to claim 15, wherein the management information includes information which represents a ratio P_m/P_1 between the third power level P_m and the second power level P_1 , and the ratio P_m/P_1 is adjusted in response to the linear velocity.

21. The information-recording medium according to claim 15, wherein the management information includes values of the first power level P_h , the second power level P_1 , and the third power level P_m at a plurality of

recording speeds respectively.

22. The information-recording medium according to claim 21, wherein a value of $(P_h - P_m)$ at a high linear velocity is smaller than a value of $(P_h - P_m)$ at a low linear velocity.

23. The information-recording medium according to claim 21, wherein a value of $(P_m - P_l)/(P_h - P_l)$ at a high linear velocity is larger than a value of $(P_m - P_l)/(P_h - P_l)$ at a low linear velocity.

24. The information-recording medium according to claim 15, wherein the information is recorded with the CLV system or the CAV system.

25. A method for controlling a light power for recording information on an information-recording medium by using a light beam having at least three power levels of a first power level P_h , a second power level P_l which is lower than the first power level, and a third power level P_m which is intermediate therebetween, the method for controlling the light power comprising:

adjusting the third power level P_m in response to a linear velocity defined by the information-recording medium; and

controlling the light power to generate a multi-pulse which is repeatedly modulated at least between the first power level P_h and the adjusted third power level P_m .

26. The method for controlling the light power according to claim 25, wherein at least one of P_m/P_1 , P_m/P_h , and a ratio $(P_m - 1)/(P_h - P_1)$ is adjusted in response to the linear velocity when the third power level P_m is adjusted in response to the linear velocity determined depending on the information-recording medium.